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ABSTRACT

This study was designed to examine the validity of the Cooperative Reading Comprehension Test (CRCT), Form 1A, for advisement purposes. During the period under study, February 1967 through September 1969, 1,020 people took the test, and 39 percent of those tested enrolled at Hofstra University. CRCT scores on the average differentiated those who attended the university from those who did not, but did not differentiate those who were still attending from those who withdrew. No statistical differences were found among the three groups in age or sex, but the mean score for nonattenders was always significantly lower than comparable groups of attenders or withdrawers. For both attenders and withdrawers, total CRCT score correlated low or moderately with selected academic subjects as well as cumulated grade-point average. However, total CRCT scores were able to differentiate those at the low end of academic achievement. No statistically significant advantage for low CRCT scorers from taking a reading course was indicated. Norms were calculated based on the 398 students who attended, and the 20th percentile cutoff for advising a reading course was 162. Tables and references are included. (Author/AW)

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Report #100
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CENTER FOR THE STUDY OF HIGHER EDUCATION

HOFSTRA UNIVERSITY

Validation of the Use of the Cooperative Reading Comprehension Test by University College at Hofstra University, 1967-1970

Pauline Lichtenstein and Harold E. Yuker

ED 061019

Summary

Form 1A of the Cooperative Reading Comprehension Test (CRCT) is currently used by University College for advisement purposes. This study was designed to examine the validity of the test for this purpose. The period under study was February 1967 through September 1969. During this time 1,020 people took the test, 39 percent of those tested enrolled at Hofstra University. Of the 398 who did enroll, 24 percent were still in attendance as of September 1970 and 76 percent had withdrawn. A short questionnaire should be administered at time of testing to shed some light on these high attrition rates.

Over the past five years the number of tests administered has declined appreciably, from about 450 for the 1967 calendar year to about 150 for the 1971 calendar year. The number of testing sessions has been cut back accordingly from about 16 to 8 sessions and could possibly be cut back even further. University College should consider whether the service it provides for this few people ought to be continued. The individual diagnostic value could be weighed against the cost. Last year's testing cost about $150.

CRCT scores on the average, differentiated those who attended Hofstra from those who did not attend, but did not differentiate those who were still attending from those who withdrew. The mean total reading score for those still in attendance was similar to those who had withdrawn but the mean for each group was significantly higher than the mean for those who never attended. Although there were no statistical differences among the three groups in age or sex, the mean reading score for non-attenders (whether old or young, male or female) was always significantly lower than comparable groups of attenders or withdrawers.

Correlations between total CRCT and selected academic subjects as well as cumulated GPA after 12-15 semester hours were low to moderate. They were similar for attenders and withdrawers. Analysis indicated that total CRCT scores could differentiate those students whose academic achievement was at the low end.

It was possible to analyze the relationship between taking a reading course when CRCT scores warranted it and grades in academic subjects because there were enough students with "low" scores who had not taken Reading 1. This analysis indicated no statistically significant advantage to taking the course although there was a trend in the proper direction. There was a significant relationship, however, between taking a reading course when the score was either 162 or lower or 155 or lower and remaining in attendance for at least 12 semester hours.

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Norms were calculated based on the 398 University College students who attended. For the period under study the cutoff score for advising a reading course was based on full-time day session students. The 20th percentile cutoff score was 162. However, for University College students the 20th percentile cutoff score was 155. In addition, analysis indicated that many applicants to University College, especially older females, may have been unduly penalized for slowness of reading. The University College staff may went to consider whether the cutoff score for requiring a reading course ought to be based on the adult part-time student's performance rather than on the full-time day freshman's performance and whether an untimed test would be fairer to their applicants. If the latter course is chosen, data ought to be collected so that this procedure could be evaluated.

Recommendations

On the basis of the data herein reported, we would make the following recommendations:

1. The CRCT as currently used has some value but the number of applicants tested has been decreasing. About 150 people were tested in 1971. A decision should be made whether to abandon the test since its use as a screening device has all but disappeared, or whether it should be continued as a diagnostic service to applicants.

2. If we continue to use the CRCT, the following changes should be instituted:

   a. It should be administered as an untimed test.

   b. A questionnaire should be administered together with the test to get information that will help predict who will not enroll. This may help reduce the number of tests to be administered even further.

   c. A score of 155 should be used as a cut off.

3. An attempt should be made to systematically evaluate the utility of the reading course. The only way this could be done is if 50% of all students scoring below the cut off would be randomly selected and forced to take reading as a condition of enrollment.

4. Data should be accumulated so that the new procedures can be evaluated.

(Copies of the full report are available from the Center for the Study of Higher Education)

Report #100
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Validation of the Use of the Cooperative Reading Comprehension Test by University College at Hofstra University, 1967-1970

Pauline Lichtenstein and Harold E. Yuker

For the last several years, the Cooperative Reading Comprehension Test (CRCT) published by the Educational Testing Service has been used as a screening and advisement device for students seeking admission to University College at Hofstra University. University College offers programs primarily intended for part-time students. Potential students who score below the 20th percentile on this test are advised to take a reading course before registering for other courses. The present study was designed to determine the validity and utility of this test as currently administered as an admission requirement. An ancillary question asked was whether applicants to University College were unduly penalized for lack of speed in reading.

The CRCT measures reading achievement by averaging a vocabulary score and a comprehension score to yield a total reading score. Two scores are calculated for the comprehension score; a level of comprehension score which is presumably not affected by reading speed and a speed of comprehension score. In order to test the hypothesis concerning the role of speed in the test, separate analyses were done for the level of comprehension score and for the total reading score.

Hofstra currently uses Form 1A of the test, which was first used in February 1967. From that date through September 1969 the test was administered to 1,020 people, 622 (61%) of whom did not enroll at Hofstra and so there is no validating data for them. That leaves 398 (39%), which is the group on which analyses were done. Of these students, 96 (24%) were still attending as of September 1970 and 302 (76%) had withdrawn by then. None had graduated.

Over the years under analysis and to the present time there has been a downward trend in the number of tests administered. This reflects the declining enrollment of freshmen in University College. Table 1 presents the data broken down by attended and never attended. The latter category was not broken down into those still attending and those already withdrawn since the time during which withdrawal could have occurred was too variable. For both the spring semester and the fall semester of 1971 the number tested was about 1/3 as large as five years ago. Over the same period, the proportion of applicants who did in fact register for classes increased from about 1/3 to about ½.

Table 1

The Number of Cooperative Reading Comprehension Tests Administered to University College Applicants From February 1967 to September 1971

	Spring Semester					Fall Semester				
	Attended		Never Attended		Total	Attended		Never Attended		Total
	N	%	N	%	N	N	%	N	%	N
1967	56	30	128	70	184	87	32	181	68	268
1968	36	35	66	65	102	90	45	111	55	201
1969	45	50	45	50	90	84	48	91	52	175
1970	40	43	53	57	93	60	50	60	50	120
1971*	37	61	24	39	61	48	53	42	47	90

*Includes 13 students from Cooperative College Educational Center

Records have also been kept for the past five semesters on the number of people who said they would appear for a testing session and those who actually did. There was an attrition rate of about 50% and this has been fairly stable over these five semesters.

Table 2 presents both the mean total score and the mean level score for three categories of test takers; those still in attendance (Att.), those no longer in attendance as of September 1970 (With.), and those who never registered for courses at Hofstra (N. Att.). Comparison of the mean total score and mean level score by t test indicated that there were no statistically significant differences in the mean scores of those still in attendance and those who had already withdrawn. The mean scores for those who never attended were significantly lower than either of these two groups.

Since there is no way of validating the scores achieved by those who never attended in terms of future academic achievement, we can only hypothesize about their lower scores. It may be that the test served as a self-imposed screening device in that those who scored "low" interpreted that to mean that they are not college material. It may also be, that the requirement of taking a reading course before taking other courses may have discouraged some "low" scorers from attending Hofstra. A short survey administered to these people at the end of the testing session would be helpful in ascertaining their reasons for not attending Hofstra.

Table 2

The Cooperative Reading Comprehension Test - Data by School Status
Based on the Performance of Applicants to
University College from February 1967 through September 1969

Percentage of Applicants Scoring Lower than Selected Scores								
	TOTAL SCORE				LEVEL SCORE			
Score	Att.	With.	Att.+ With.	Never Att.	Att.	With.	Att.+ With.	Never Att.
Over 175	100	100	100	100	--	--	--	--
175	99	98	98	99	100	100	100	100
170	86	89	88	95	94	95	95	98
165	66	65	65	87	75	74	74	88
160	36	42	41	71	41	45	44	71
155	24	21	22	45	23	27	26	51
150	12	9	10	25	17	12	13	30
145	5	3	4	10	14	7	9	19
140 & lower	1	1	1	4	5	3	4	11
Number of Applicants	96	302	398	622	96	302	398	622
Mean	161.5	161.6	161.6	156.1	159.5	159.8	159.6	154.2

Table 3 presents the mean age and distribution of ages and sex for those attending, withdrawn, and never attended. Although the mean age for those who never attended was lower than those who were either still attending or withdrawn the difference was not significant. Similarly, the percentage of males was greater among the non-attenders, but not significantly different from those attending or withdrawn. And in both instances attenders were not significantly different from those who withdrew.

About 1/3 of the people tested for University College were young; 17-21 years of age and almost 2/3 were 22 years and older. The mean age for the whole group was about 27 years. Overall, a majority of the students tested were male (57%). This preponderance of males held for the older students and the younger people who never attended Hofstra, but among the younger students who began University College, there were more females than males.

Table 3

Applicants to University College From February 1967 to September 1969 by Age, Sex and School Status

	Attending		Withdrawn		Never Attended		Total	
	N	%	N	%	N	%	N	%
AGE								
37 and Older	15	15	65	22	86	14	166	16
27-36	23	24	55	18	148	24	226	22
22-26	22	23	73	24	161	26	256	25
17-21	36	38	107	35	225	36	368	36
No Data	0	0	2	1	2	0	4	1
Total	96	100	302	100	622	100	1,020	100
Mean	27.1		28.0		26.6		27.1	
SEX								
Male	51	53	161	53	367	59	579	57
Female	42	44	136	45	246	40	424	41
No Data	3	3	5	2	9	1	17	2
Total	96	100	302	100	622	100	1,020	100
22 and Older								
Male	37	63	110	58	246	63	393	62
Female	22	37	80	42	144	37	246	38
Total	59	100	190	100	390	100	639	100
21 and Younger								
Male	14	41	51	49	120	54	185	51
Female	20	59	54	51	101	46	175	49
Total	34	100	105	100	221	100	360	100

Cross-tabs by age, sex, school status are presented in Table 4. The data are presented for Attending and Withdrawn combined. Separate mean scores for Attending and Withdrawn were calculated and compared with each other for all eight groups. Significance tests performed indicated that none of the differences were significant at the .05 level. This was also the case for the means of all groups combined as reported in the discussion of Table 2. Since a good theoretical case could be made that the Attending and Withdrawn groups were similar to each other in that they both started classes, and different from the Never Attended groups who never attended Hofstra, it was decided to combine them in the analysis.

Analysis of the differences between the combined mean scores of Attending and Withdrawn and Never Attended for the eight groups indicated all differences were significant at the .01 level. Thus, the original analysis mentioned above (Table 2) for the overall means was confirmed for all groups analyzed - young and old as well as male and female for both total score and level score. CRCT scores did differentiate those who attended Hofstra from those who did not.

Comparisons of the means for young and old students or male students and female students, or total score and level score within the Never Attended group or the Attending + Withdrawn group yielded some significant differences but too few for them to be considered other than chance occurrences. On the average, as reported in Table 2, the level score was about two points lower than the total score for both Attending and Withdrawn combined and Never Attended. These differences were not statistically different. It is interesting to note, however, that the two groups, out of the eight, that averaged significantly lower on level score than on total score were the older females who either attended or did not attend Hofstra. It is also interesting that the lowest mean score for all eight groups presented in Table 4 was the level score for the older female student who did not attend Hofstra.

In summary, attending or not attending University College seems related to CRCT total and level scores but school status (Attending or Withdrawn) does not. This relationship held for the young (21 years of age and younger) and old (22 years of age and older) as well as for male and female. On the average there was no statistical difference between the total score and the level of comprehension score.

Association of Reading Scores and Grades in Selected Academic Subjects

The product-moment correlation coefficients (and the number of students included) between both total score and level score and specific grades in Reading, English, and History courses and Grade Point Average for the first 12-15 hours are presented in Table 5. Since University College students are part-time and the number of semester hours they take a semester

Table 4

Mean Cooperative Reading Test Total and Level Scores for University College Students by Age, Sex, and School Status

	21 and Younger N	21 and Younger Score	22 and Older N	22 and Older Score
Male Total Score				
Attending + Withdrawn	65	160.2	147	162.2
Never Attended	120	156.1	246	156.5
Male Level Score				
Attending + Withdrawn	65	160.9	147	160.8
Never Attended	120	155.2	246	155.4
Female Total Score				
Attending + Withdrawn	74	160.1	102	163.1
Never Attended	101	155.5	144	156.1
Female Level Score				
Attending + Withdrawn	74	158.9	102	157.8
Never Attended	101	155.0	144	150.9

Note: The Means between Attending + Withdrawn vs. Never Attended are significantly different from each other for all groups at p=.01.

varies, it was necessary to eliminate this variation by calculating the GPA over 12-15 hours for all of them. This is considered to be the equivalent of one semester's full-time work.

The coefficients for total reading score and grades ranged from .18 to .56 for those students who were still in attendance and from .26 to .54 for those who had withdrawn. The correlation coefficients for level score and grades ranged from .03 to .43 for those who were still in attendance and from .10 to .46 for those who had withdrawn. The differences between Attending and Withdrawn correlation coefficients within both total score and level score, except those involving History 1, were not statistically significant, and those two out of 44 comparisons may have occurred by chance.

Table 5

Correlations Between Total and Level Reading Scores
and Grades in Academic Subjects

	TOTAL SCORE						LEVEL SCORE					
	Att.		With.		Att.+ With.		Att.		With.		Att.+ With.	
	N	R	N	R	N	R	N	R	N	R	N	R
READING 1	31	.49*	80	.34*	111	.38*	31	.43*	80	.10	111	.21*
ENGLISH 1	70	.31*	118	.38*	188	.33*	70	.18	118	.27*	188	.21*
ENGLISH 2	68	.31*	58	.43*	126	.34*	68	.20	58	.24	126	.20*
ENGLISH 1 + 2	56	.38*	50	.52*	106	.42*	56	.26	50	.29*	106	.23*
ENGLISH 11	31	.48*	15	.24	46	.38*	31	.27	15	.13	46	.22
ENGLISH 12	31	.51*	8	.61	39	.50*	31	.32	8	.06	39	.26
ENGLISH 11 + 12	28	.56*	8	.59	36	.55*	28	.30	8	.01	36	.25
HISTORY 1	56	.20	50	.54*	106	.35*	56	.08	50	.46*	106	.25*
HISTORY 2	44	.18	27	.26	71	.13	44	.06	27	.20	71	.04
HISTORY 1 + 2	40	.19	25	.38*	65	.22	40	.03	25	.34	65	.10
GPA (12-15 hours)	83	.33*	74	.47*	157	.33*	83	.20	74	.20	157	.13

*Significant at at least .05 level

This is another demonstration of the similarity between the Attending and Withdrawn groups reported in the first section of this report. Since this is so, we will consider only the correlations between total score or level score and academic grades for the combined group of Attending and Withdrawn.

The correlations involving total score were all low to moderate and ranged from the lowest of .13 for History 2 to the highest of .55 for English 11 and 12 combined with a median correlation of .38. All the correlation coefficients except History 2 (.13) and History 1 + 2 (.22) were significantly different from .00. The correlations appear to be no better and no worse than those reported in other studies. The Technical Report for the CRCT (Page 5) has a summary of studies that reported correlation coefficients involving total scores. There are two reports that involve total score and first

semester GPA and the coefficients were .27 and .43. One study reported a correlation of .44 between Freshmen English grades and total score. These studies were probably for Day Session students. For the University College students studied in this report the correlation coefficient between total score and GPA was .33 and between total score and English 1 + 2 was .42.

All the correlations between level score and grades in this study were lower than those between total score and grades although none of the differences were statistically significant. For students still in attendance or already withdrawn, the correlations involving level score ranged from the lowest in History 2 (.04) to the highest in English 12 (.26) with the median at .21. Level score and GPA for 12-15 hours was .13. Only five of the 11 correlation coefficients were significantly different from .00; level score vs Reading 1 (.21), English 1 (.21), English 2 (.20), English 1 + 2 (.23), and History 1 (.25).

In summary, the relationship between CRCT scores (total or level) and selected academic grades was similar for Attenders and Withdrawers. The total score was most highly correlated (for Attending and Withdrawn combined) with English 11 and 12 combined (.55), next with English 1 and 2 combined (.42), next with Reading grades (.38), next with GPA for the first 12-15 semester hours (.33), and last with History 1 and 2 combined (.22). The correlation (History 1 + 2) was the only one not significantly different from zero. Also, the other four were not significantly different from each other.

Further analysis was performed by dividing the sample into those students attaining total reading scores of 162 or lower and those attaining 163 or higher. This broke the sample roughly at the mid-point, and it was also approximately the cutoff score below which a reading course could be required. The grades were trichotomized into low, medium, and high. Table 6 reports the grades achieved by students (Attending and Withdrawn combined) in English 1 + 2, English 11 + 12, and History 1 + 2, and the GPA for the first 12-15 semester hours for students with total scores of either 162 and lower or 163 and higher. This kind of comparison helps elucidate the level at which the relationship was strongest. Total reading scores were more often related to low and high grades than to grades in the middle. This can be seen from the table. The percentage of students receiving low grades was always greater for students scoring lower on the reading test. Conversely, the percentage of students receiving higher grades was always higher for the student scoring higher on the reading test. Chi-square was significant at .05 for the comparisons involving English 1 + 2, History 1 + 2, and GPA. The comparison involving English 11 + 12 was in the same direction but the N was too small for significance to be reached. Incidentally, this is what is often found when comparing standardized test scores and achievement as measured by grades; the tests often predict for the high end, occasionally for the low end and rarely for the middle group.

Table 6

Combined Subject Grades[1] and Total Reading Score
(Attending and Withdrawn Combined)
Divided into 163 and Higher and 162 and Lower

Grades	Total Reading Scores: 163 and Higher N	%	162 and Lower N	%
English 1 and 2*				
Low	0	0	7	18
Medium	47	70	27	69
High	20	30	5	13
Total	67	100	39	100
English 11 and 12				
Low	2	8	2	20
Medium	16	61	7	70
High	8	31	1	10
Total	26	100	10	100
History 1 and 2*				
Low	5	12	6	27
Medium	24	56	16	73
High	14	32	0	0
Total	43	100	22	100
GPA (12-15 hours)*				
Low	8	8	14	23
Medium	66	69	45	74
High	22	23	2	3
Total	96	100	61	100

[1]Letter grades converted to numbers using A=4; B=3; C=2; D=1; F or X = 0; low is 0-3; medium is 4-6; and high is 7-8.

*Chi-square significant at .05 level

It would seem that the total score of CRCT has been able to differentiate those students whose academic achievement as measured by grades were at the low end.

Relationship Between Taking a Reading Course and Grades in Academic Subjects

Taking a reading course was operationally defined as having a recorded grade of A, B, C, D, F, or X in Reading 1 at Hofstra. Of the 111 grades recorded in Reading 1 there were no F's or X's and only 3 D's. It was therefore assumed that all students benefited somewhat from the course.

Since CRCT scores are used for advisement purposes only, the advisor in consultation with a student may decide that the score is not reflective of a student's ability and therefore not insist upon a reading course. The intervention of advisers in the assignment of students to reading or no reading may introduce bias into the results of the following analysis. It is always possible that the students who did in fact take a reading course benefited from it in that their academic performance was brought up to the level of those who did not appear to need a course. A properly controlled experiment would necessitate random assignment to the two conditions - reading or no reading course. Because of these limitations the results discussed in this section should be treated as tentative.

Of the 197 students who took courses at Hofstra and had a score below 163 on the CRCT total component 81 took Reading 1 and 116 did not. The differential academic achievement of these two groups was analyzed. The GPA for those who took reading was 2.33 and for those who did not 2.26. Although the difference was in the proper direction, the difference was not statistically significant ($t > .05$). We next analyzed the grades in the academic subjects under study of students who scored at 162 or below and either took Reading 1 or did not take Reading 1. None of the differences in grades for English 1 and 2, English 11 and 12, or History 1 and 2 were statistically significant. (The Mann-Whitney "U" Non-parametric Test for small samples yielded non-significant results at the .05 level).

Next we split the sample of takers and non-takers at 155 since 155 is the score below which 20 percent of the University College students scored. The 20th percentile is the one usually used for recommending a reading course. Again, we analyzed the academic achievement of students who took or did not take a reading course even though they all scored among the lowest 20 percent of the sample. There were 37 students who took reading and 49 who did not for a total of 86 students who scored below 155. Again, no significant differences in grades were found. The difference in the GPA after 12-15 hours between those who took Reading 1 and those who did not was in the proper direction; 2.41 and 2.26 respectively, but also not significant.

Table 7

Relationship Between Taking a Reading Course and School Status for Scores of 163 and Lower and 155 and Lower

	163 and Lower*			
	Took Reading		Did Not Take Reading	
	N	%	N	%
Attending	26	32	18	16
Withdrawn	55	68	98	84
Total	81	100	116	100

	155 and Lower*			
	Took Reading		Did Not Take Reading	
	N	%	N	%
Attending	17	46	6	12
Withdrawn	20	54	43	88
Total	37	100	49	100

*Chi-square significant at at least .01 level

Although there appeared to be no statistical difference in academic achievement between those students taking a reading course and those not taking one, there was a relationship between taking a reading course, when the reading score warranted it, and continuing in attendance. For students with scores of 162 and lower chi-square was significant at $<.01$, and for students with scores of 155 and lower chi-square was significant at $<.001$. Of the 81 students who took a reading course and had a score of 162 or lower, 32 percent were still in attendance and 68 percent had withdrawn; while of the 116 with similar scores who had not taken a reading course, 16 percent were still in attendance and 84 percent had withdrawn. The pattern for those who scored at 155 or lower was even more pronounced. Forty-six percent of the 37 who had taken a reading course were still attending and 54 percent had withdrawn while 12 percent of those who had not taken a reading course were in attendance and 88 percent had withdrawn. If we realize that for the

overall sample 302 of 398 or 75 percent had withdrawn, it is fair to say that taking a reading course when the score warranted it increased the probability of remaining in attendance for at least 12 semester hours.

Looking at Table 7 another way, one sees that a greater proportion of students in attendance had taken a reading course and a greater proportion of students who withdrew had not taken a reading course.

Normative Data for University College Students' Performance on Cooperative Reading Comprehension Test

For the period under study, February 1967 through September 1969, percentile norms for total CRCT scores was calculated, based on the 398 University College students who started classes. The criterion used at Hofstra for requiring a remedial or developmental course is a score below the 20th percentile. The cutoff percentile used for University College students over the last few years is the one based on all incoming day session freshmen. The 20th percentile for day session students corresponded to a total reading score of 162 until September 1971 when it was up-dated to 160. The score that corresponded to the 20th percentile for the 398 University College students was 155.

In order to shed light on this lower 20th percentile cut off for University College students, we examined the role of speed of reading on their scores. Level scores, which are considered to be power of reading scores, and total scores were therefore compared. The level score is presumed to be unaffected by time. This is so, however, only if the student does in fact answer all 30 items in the first reading comprehension section. We have reason to believe that many "low" level scores attained by people tested by University College are due to not answering all 30 items. The technical manual for the test reports that 7 percent of a sample of freshmen did not answer the thirtieth item. In the testing sessions provided for September 1968 applicants about 25 percent failed to answer the thirtieth item. (For the same period only about 3 percent of a sample of day session students did not answer the thirtieth item). We thought that the number of correct answers expressed as a percentage of the number of items attempted could be considered to be a rough estimate of power of reading. From a sample of answer sheets, about 1/3 of those scoring below the 20th percentile might have scored higher if they had more time. For them, the percentage of correct answers was about equal to those scoring above the 20th percentile.

What seems to be happening is this. What the designers of the CRCT and this investigator assumed to be a power score (level score) is for many University College applicants a speed score. Their slowness of reading, rather than poor comprehension, is pulling the total score down. Older females who scored significantly lower on level score than on total score and whose total score was not different from other groups appeared to compensate for their lower speed score by a high vocabulary score.

If CRCT scores for University College students are depressed because of slow reading, an alternative to be considered is administering the test under untimed conditions. Daly and Stahmann (1968) investigated the effect of time limits on the Cooperative English Expression Test and concluded "it does seem to indicate that a timed test...does not completely differentiate between the 'slow working' student and the student with inadequate skills. (p. 104)

References

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